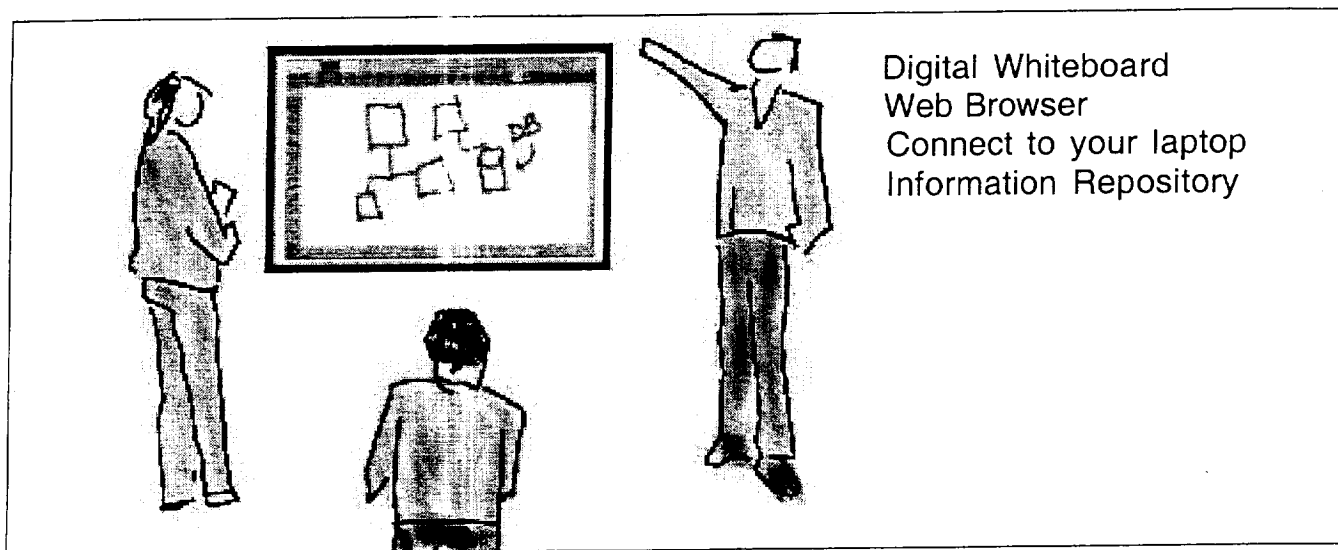


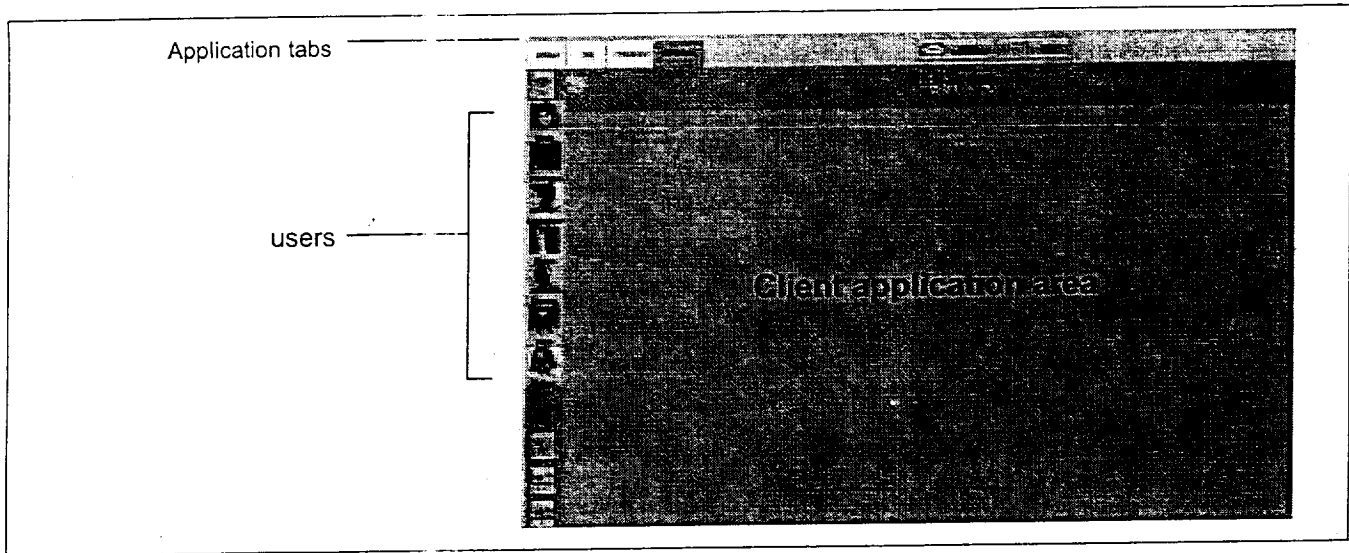
1 BRIEF OVERVIEW

1.1 GENERAL

An important goal of MERBoard is to allow users to quickly and easily share information. The front-end interface is physically a large plasma computer display with a touch screen, allowing multiple people to interact shoulder-to-shoulder or in a small meeting area. The software system allows people to interactively create digital whiteboards, browse the web, give presentations and connect to personal computers (for example, to run applications not on the MERBoard computer itself).



Generally speaking, the front-end software is divided into two sections: the framework and the client area. The framework displays global information such as the pictures of currently logged in users and a set of tabs to different client applications. The framework surrounds the client area. As the user clicks on different application tabs, each application fills the client area.



1.1.1 Four Major, Integrated Applications

- **A browser:** as a general tool for accessing information, both personal and on the web, MERBoard supports a general browser. Information from the browser can be copied and pasted into the whiteboard for further annotation, or emailed to other users.
- **A remote connection to another computer (VNC):** sometimes the user has information or software on another computer and wants to display it on the bigger board for all to see (or to capture into the whiteboard). VNC supports rendering the user's computer display in the client area. The user can interact with their computer remotely through MERBoard, or interact on their computer and have everyone see it on the MERBoard.
- **A digital whiteboard:** like its physical counter-part, you can produce freehand drawings. You can also create shapes, import images, and annotate the images. The digital whiteboard can then be saved in your shared space or emailed to other people. Multiple whiteboards can be created.
- **A digital space (MERSpace):** each user has their own digital repository where documents, images, whiteboards and email can be conveniently saved and accessed.

Architecturally, to support this system across multiple MERBoards, the front-end interface communicates to a backend server. This communication is transparent.



2 THE GLOBAL FRAMEWORK

2.1 ADDING YOURSELF TO THE BOARD

When you first approach the board, it is important to "log in" in the MERSpace tab. By doing so, are letting the system know you are in front of the board so that you can quickly access your MERSpace and share information with your colleagues. To add yourself, simply click on the "add Person" button located in the lower left (when in MERSpace):

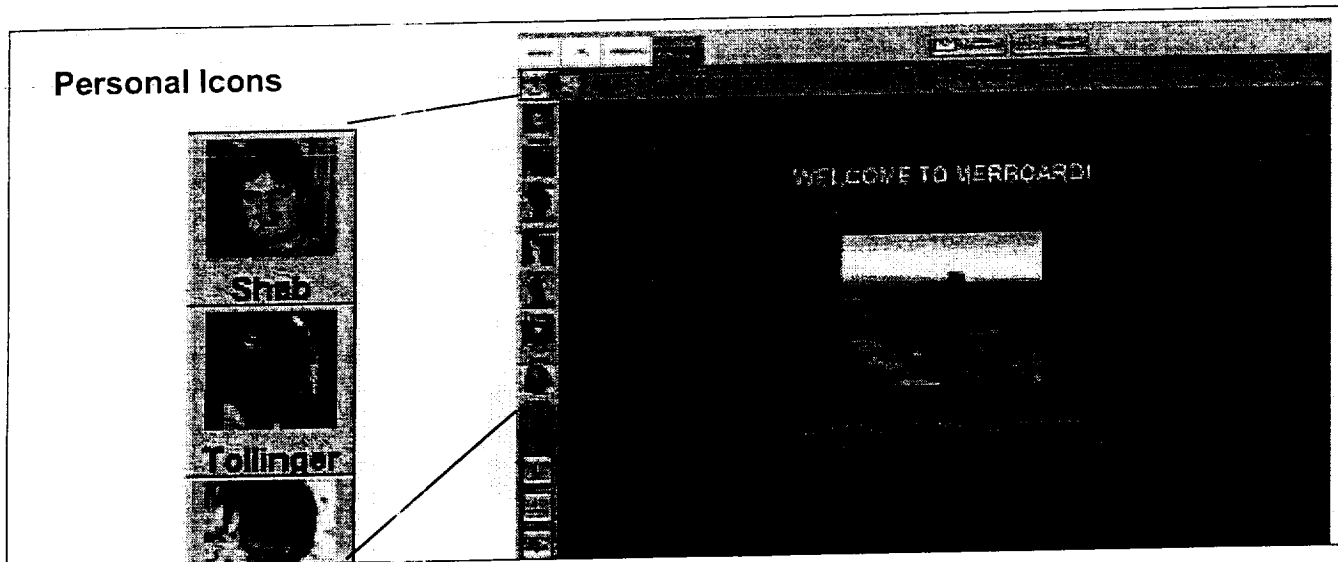


This will pop up a dialog box where you can select yourself and possibly several other members as well.

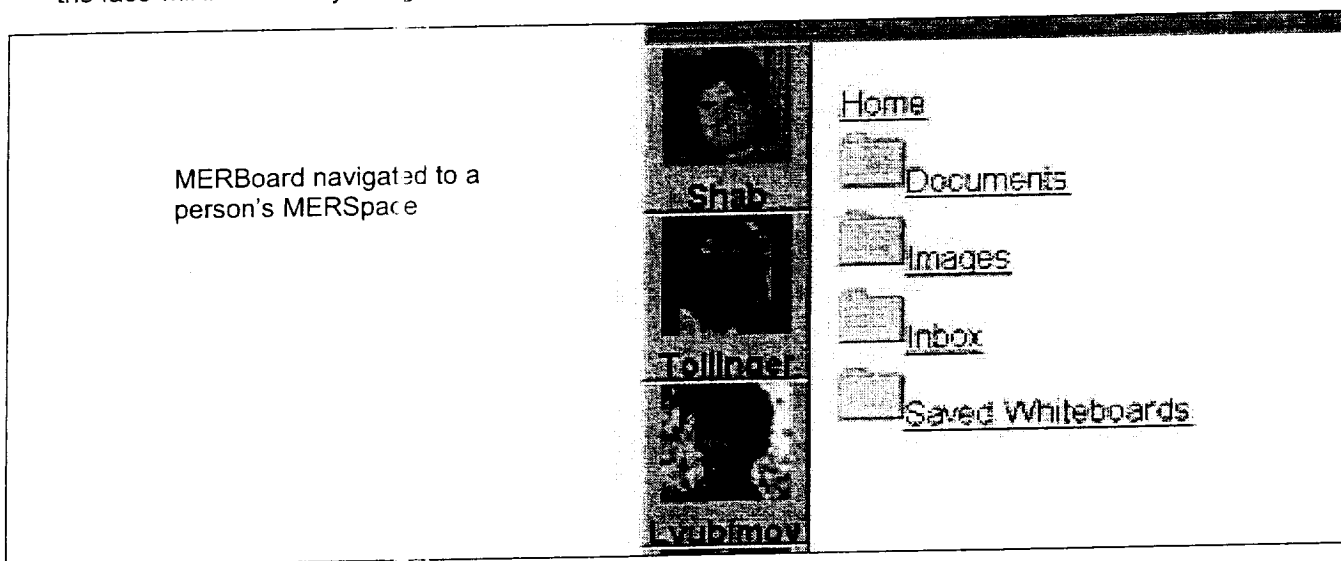


This action will create Personal Icons on the side of the board. These icons make it very easy to access your information.

2.2 PERSONAL ICONS



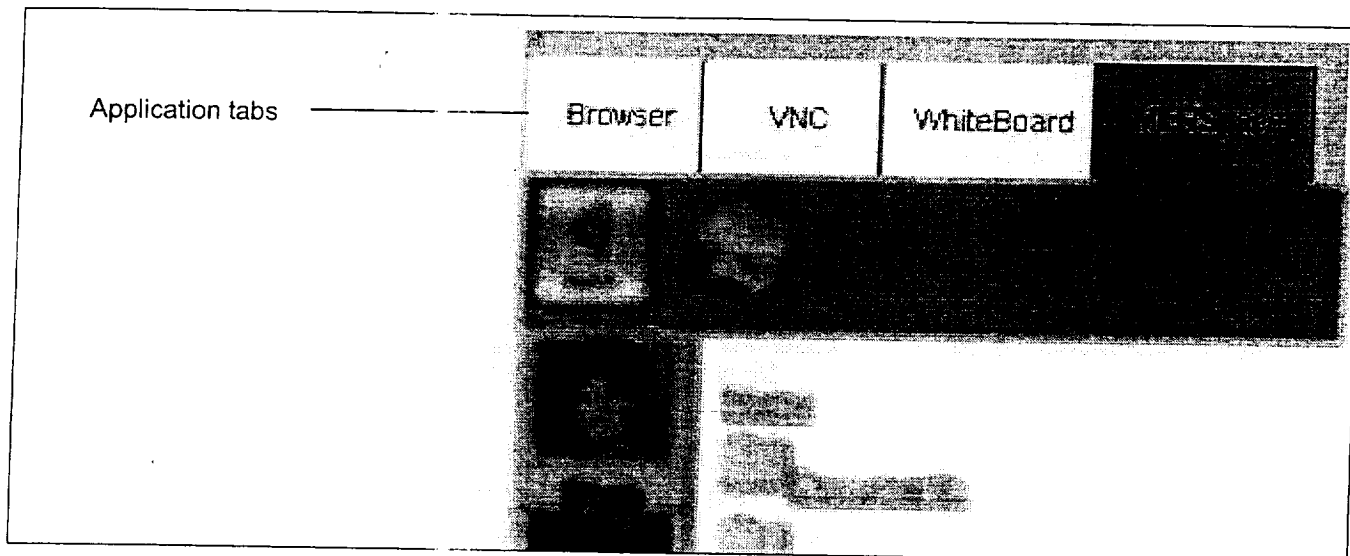
A personal icon supports fast access to individual MERSpaces (a file space for each person): Clicking on the face will immediately navigate MERBoard to that person's MERSpace.





2.3 ACCESSING CLIENT APPLICATIONS: TABS

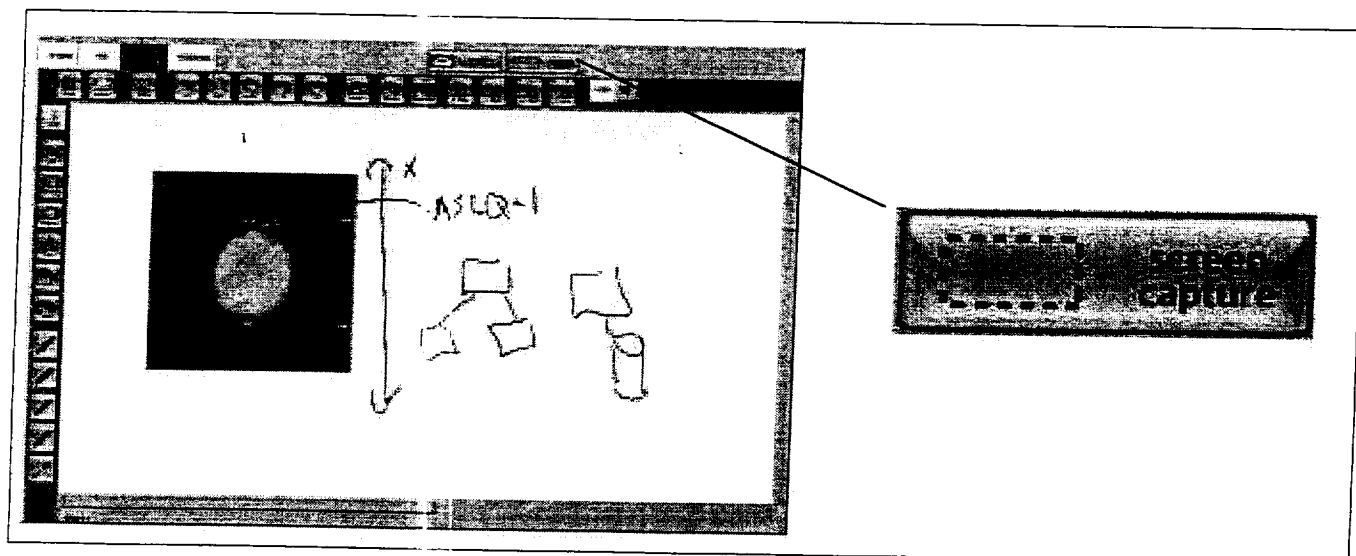
Each client application is separated and accessed through a tab panel at the top of the board:



Tabs make it easy to move quickly from one application to another and to always see what client applications are available. One interesting issue is how to move information from one application over to another. Currently MERBoard allows you to do a partial screen capture, which will take a screen shot and place it on the whiteboard.

2.4 CAPTURE

To move information from one application to another, the user can use the capture tool at the bottom of the board.

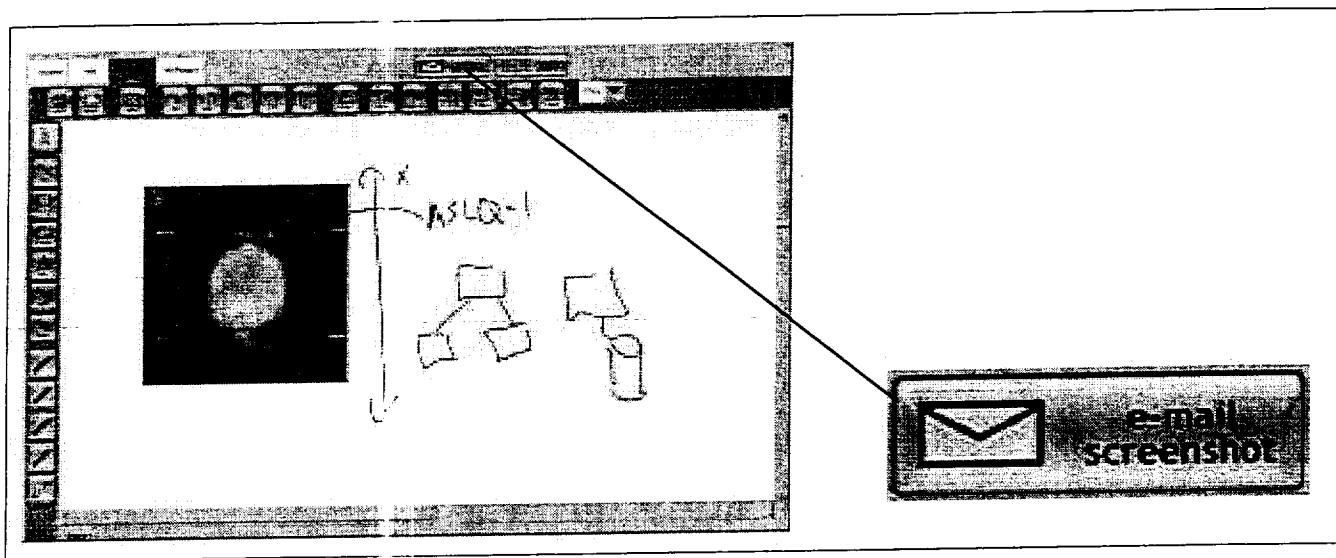


For example, say the person in front of the MERBoard has used the browser to go to an interesting web page. He or she wants to capture the image and annotate it in the whiteboard. The person simply clicks on the capture button, drags out a bounding rectangle and lets go (this is called a sweep select). The region within the rectangle will be copied automatically and placed on the whiteboard that is currently open.



2.5 EMAIL

The user also has the opportunity to email users a screen shot of what they are currently looking at. To accomplish this, simply click on the "e-mail screen shot" button. This will pop up a dialog box filled with personal icons, asking you which person or people you want to email to, you may choose any number of addressees. Hitting the "next" button pops up another dialog asking who you want to e-mail from, you may only choose one addresser. Hitting the "send" button at the bottom of this dialogue will then send the e-mail.





Email Screenshot to:

 MER-DEV	 Gossweiler	 Linde	 Lyubimov
	 Matessa	 Parke	 Palton
	 Seah	 Shab	 Tollinger
	 Trimble	 Vera	 Wales

TEST-GRP-1

TEST-GRP-2

Cancel Next

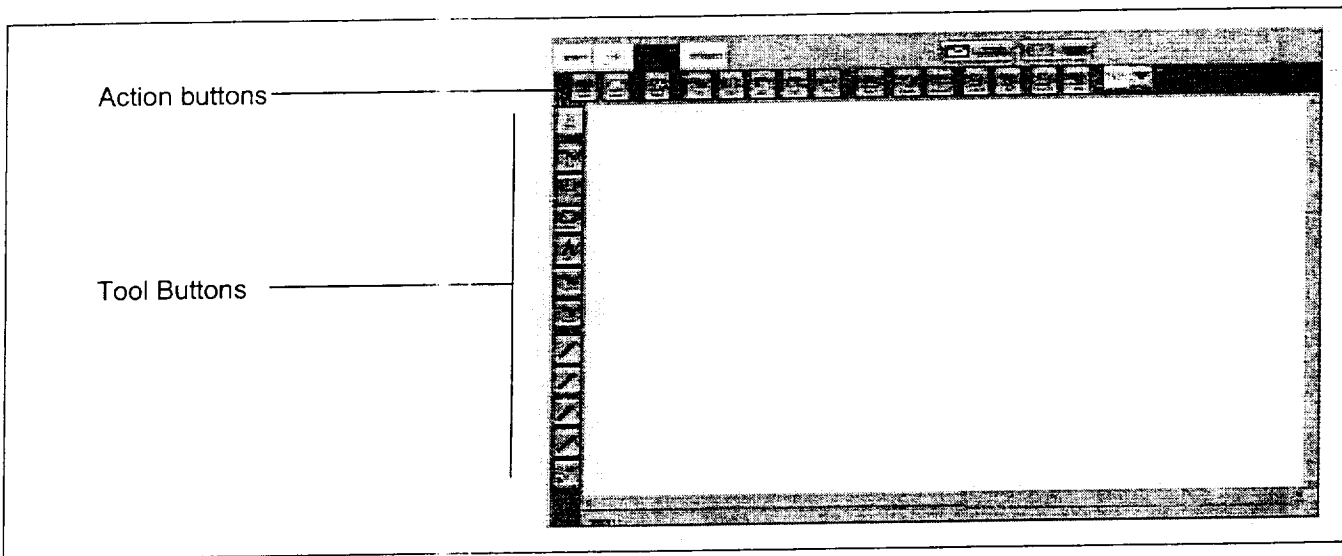


3 THE DIGITAL WHITEBOARD

3.1 PURPOSE

The whiteboard is designed to support informal notation, just as its physical counterpart does. But the digital whiteboard also allows you to save and email the board, use a larger area and create multiple boards. You can cut and paste screen captures into the board, allowing you to annotate images and do side-by-side comparisons quickly and easily. Additional shapes such as the text-rectangle, ellipse and line tool let to create flow-chart and diagram style drawings.

The layout is simple, with tools (such as rectangle and ellipse) down the left side and actions (e.g. cut and paste) along the top. The major portion of the client area is where you draw or manipulate images and objects.



Once you have placed something on the board (for example, after having drawn a line or pasted an image), it becomes a moveable object. You can select the object (selection handles appear) and then move, scale, cut etc. the object. You can also sweep-select multiple objects (drag across multiple objects) and then group the objects as one.



The following sections describe each individual button.

3.2 TOOL BUTTONS


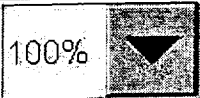
	Move Select Tool	Allows the user to select objects on the whiteboard (e.g. a drawn line or rectangle). Once the user has clicked on the object, scaling handles appear. Clicking on the handle will scale the object. Pressing down on the line between the handles and dragging will move the object. The user may sweep-select multiple objects by pressing down and dragging over multiple objects. Once several objects have been selected, they can be grouped, moved, deleted, etc.
	Line Tool	Allows the user to draw straight lines.
	Rectangle Tool	Allows the user to draw rectangles. If, after drawing the rectangle, the user types on the keyboard, text will appear in the rectangle. If the user selects the rectangle and then types, text will also appear in the rectangle.
	Ellipse Tool	Allows the user to create circles and ellipses.
	Text Tool	Allows the user to create text by typing at the keyboard.
	Ruler Tool	Allows the user to measure objects by creating a ruler in the drawing area. You can create and scale several rulers.
New Icon	Tape Measure Tool	Allows the user to draw measured lines, much like tape measures, in the drawing area.
	Pen Tool	Allows the user to draw freehand sketches. The whiteboard comes with 5 separate colors (five buttons).



3.3 ACTION BUTTONS

	Save Button	Allows the user to save the board to their MERSpace area (under saved whiteboards).
	New Button	Allows the user to create new boards. The Whiteboard application supports multiple boards. Tabs appear at the bottom for quick access between the different whiteboards.
New Icon	Close Button	Allows the user to close the currently visible board.
	Cut Button	Allows the user to cut the selected objects onto the clipboard. These cut objects can then be pasted elsewhere later.
	Copy Button	Allows the user to copy the selected items. The Copy is placed in the clipboard for later pasting.
	Paste Button	Allows the user to paste the contents of the clipboard (from a cut or copy operation) onto the whiteboard.
	Undo Button	Allows the user to undo drawing actions. This button supports multiple undos.
	Redo Button	Allows the user to put back what they undid.
	Delete Button	Allows the user to delete the selected items. Unlike cut, this does not place the deleted object in the clipboard buffer.
	Group Button	Allows the user to group multiple, selected objects together and act on them as a single unit (e.g. scaling the grouped object).
	UnGroup Button	Allows the user to ungroup a previously grouped object.
	Bring-To-Front Button	When working with multiple objects, these objects can be placed on top of one another. This operation brings the selected object to the front.

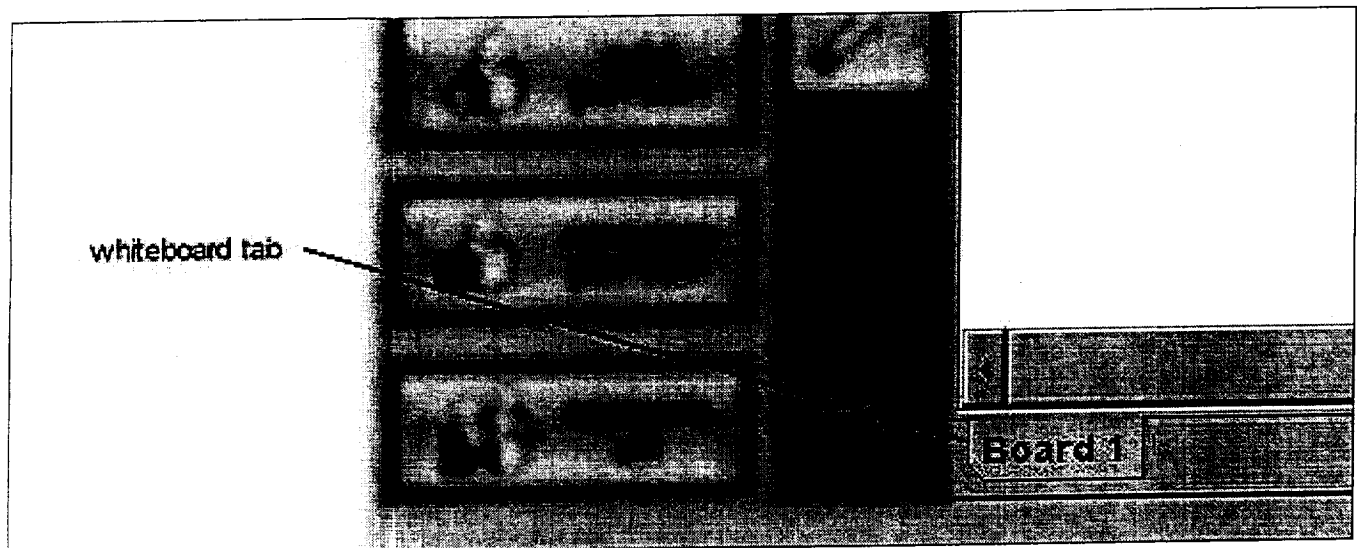


	Send-To-Back Button	When working with multiple objects, these objects can be placed on top of one another. This operation sends the selected object to the back.
New Icon	Lock Button	This button will lock down an object so that it cannot be selected. This is useful when trying to select a small object that is on top of a larger object. By locking down the large, background object, then the user can select the smaller object without accidentally selecting the large object.
New Icon	Unlock Button	This button will unlock a locked object (see Lock Button for more information).
	Zoom Button	Since the whiteboard is larger than the screen size, the user may want to zoom out to see the whole thing, or zoom in to focus on a particular detail. This pull-down tool supports this zooming.

3.4 MULTIPLE BOARDS

Often it is convenient to work with multiple boards simultaneously, flipping back and forth or using one as a scratch area. MERBoard supports multiple boards. You can create them simply by clicking on the "new board" button. You can close them in a similar fashion with the "close board" button.

To move from one board to another, simply click on the appropriate board's tab at the bottom of the client area.

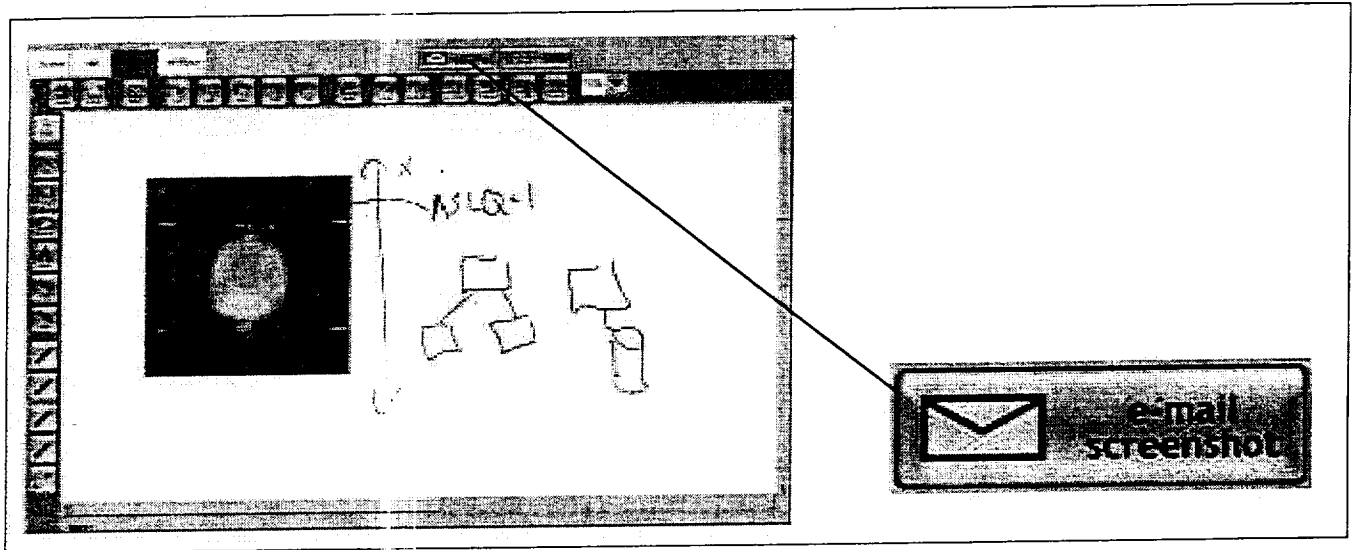




3.5 TRANSFERRING INFORMATION TO AND FROM THE WHITEBOARD

Whenever you are in any client application and you perform a partial screen capture, the image is pasted onto the current whiteboard. This makes it very easy to browse to an image and then transfer it to the whiteboard, or to use your computer through VNC to display some information and then paste it into the currently active whiteboard.

You can also email the whiteboard to other people using the general "e-mail screenshot" button

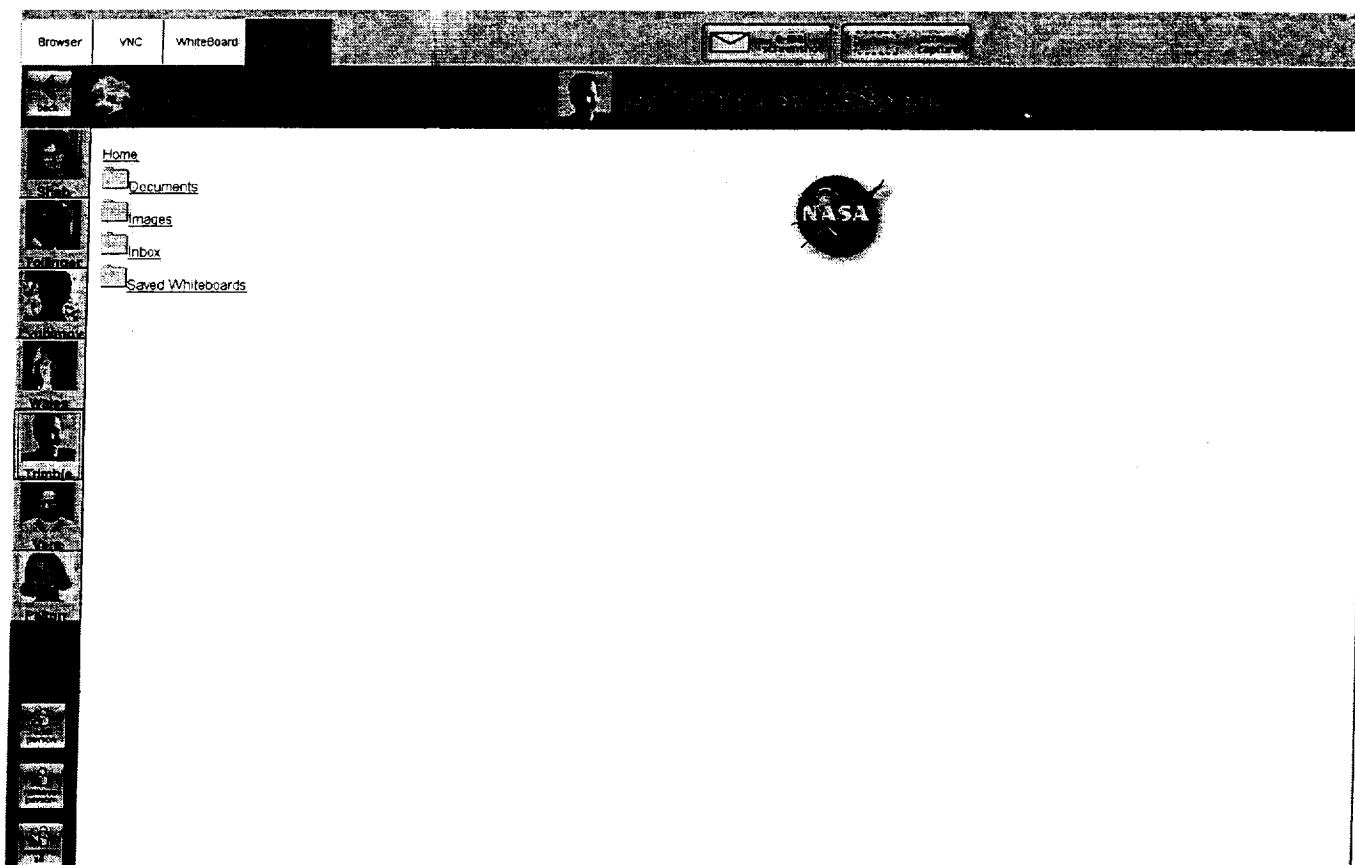




4 YOUR MERSPACE

4.1 PURPOSE

Each user gets a personal MER Space – a place to store documents, images and other information.



Because the board is used in collaboration and in a semi-public area, you should not consider this space private, but more as a means and place for holding collaborative work. The space is divided up into four areas:

- **Documents:** These are documents that you have mailed from your client computer (e.g. your laptop) to the MERBoard as *attachments*. To get something into **Documents**, simply email it as an *attachment* to merboard@jpl.nasa.gov and, in the subject line, put **publish documents**
- **Images:** These are images that you have mailed from your client computer (e.g. your laptop) to the MERBoard, as attachments. To get something into **Images**, simply email it as an *attachment* to merboard@jpl.nasa.gov and, in the subject line, put **publish images**
- **Inbox:** whenever someone emails you something through the MERBoard, a copy is also sent to the Inbox in your MERSpace. This allows you to quickly see what information others have emailed you.
- **Saved Whiteboards:** when you save a whiteboard, it is stored here. Clicking on this folder will reveal thumbnails of the boards as well as the date and time stamp of the board. Clicking on a thumbnail will



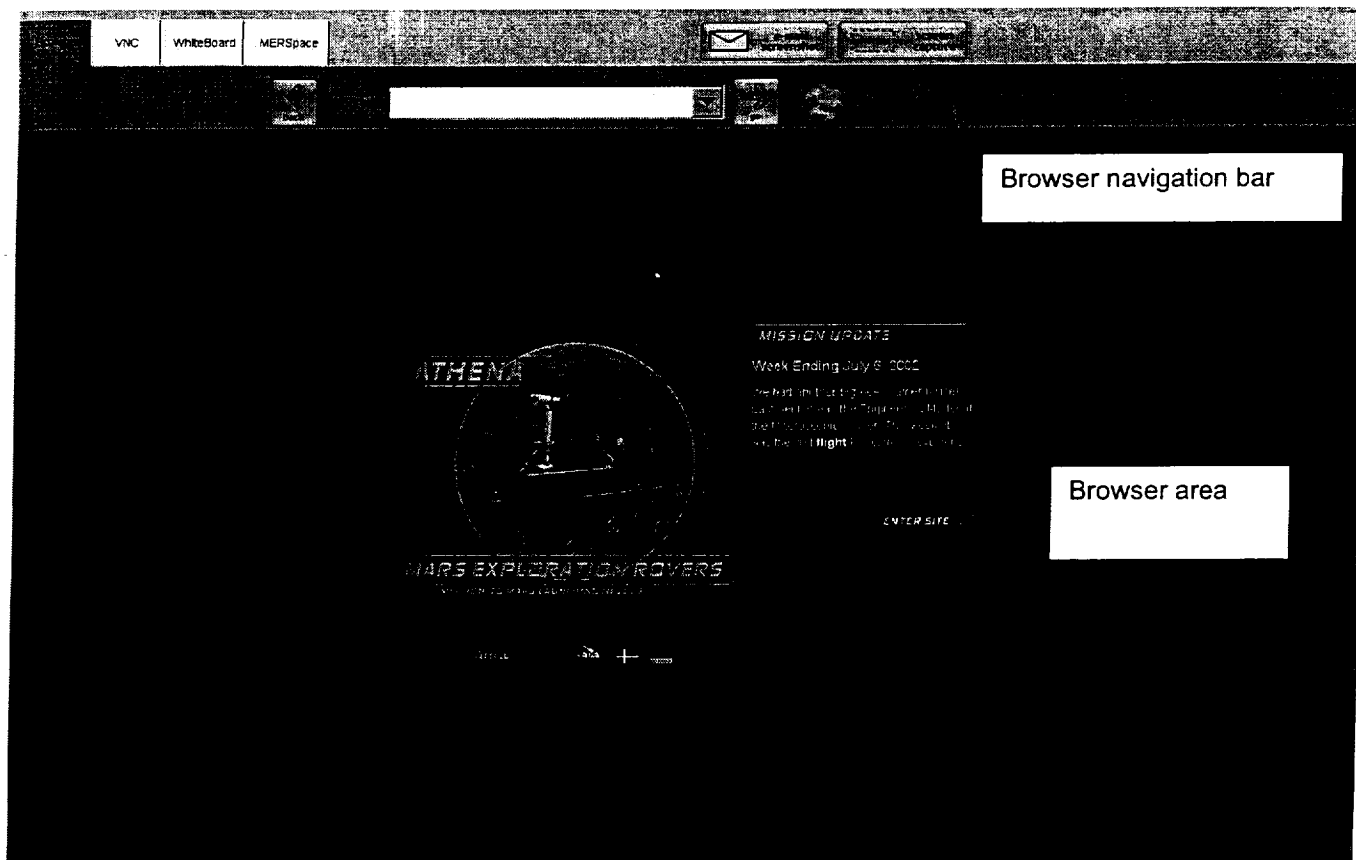
open the image in MERSpace. To use this image in the whiteboard you must sweep select the image using the Screen Capture Button.



5 THE BROWSER

5.1 PURPOSE

The web has become a ubiquitous means of sharing all sorts of information. To allow users to investigate and search for information within this vast and ever changing repository, MERBoard supports a general web browser.

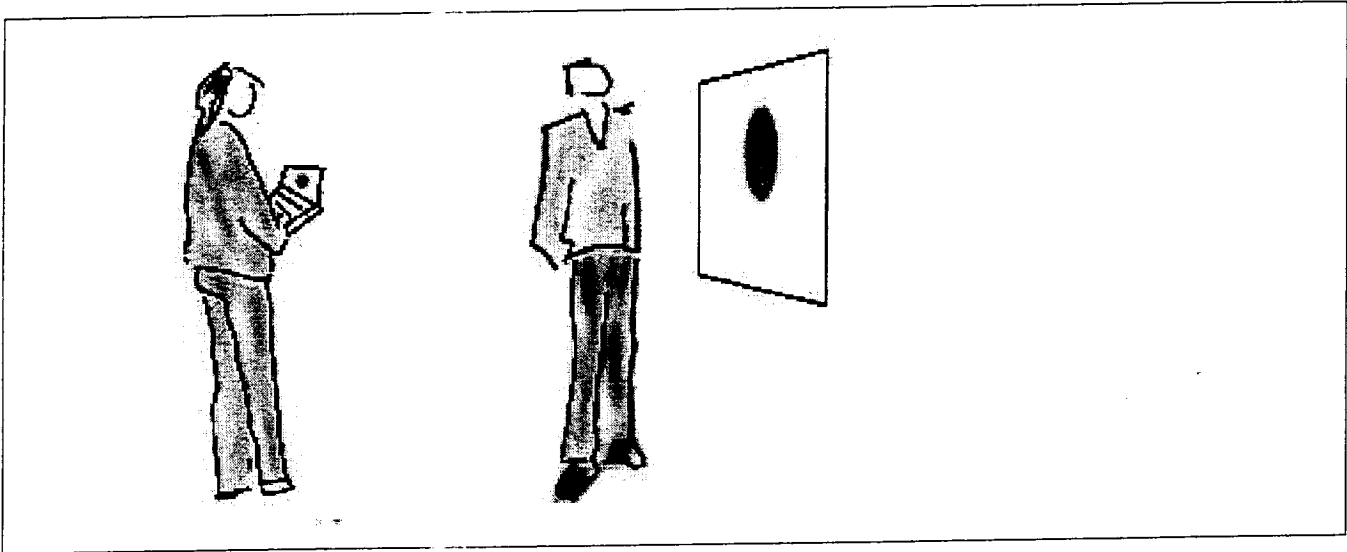


You can navigate to a particular web page and then capture that page or part of it (as an image) to the whiteboard for further annotation and analysis.

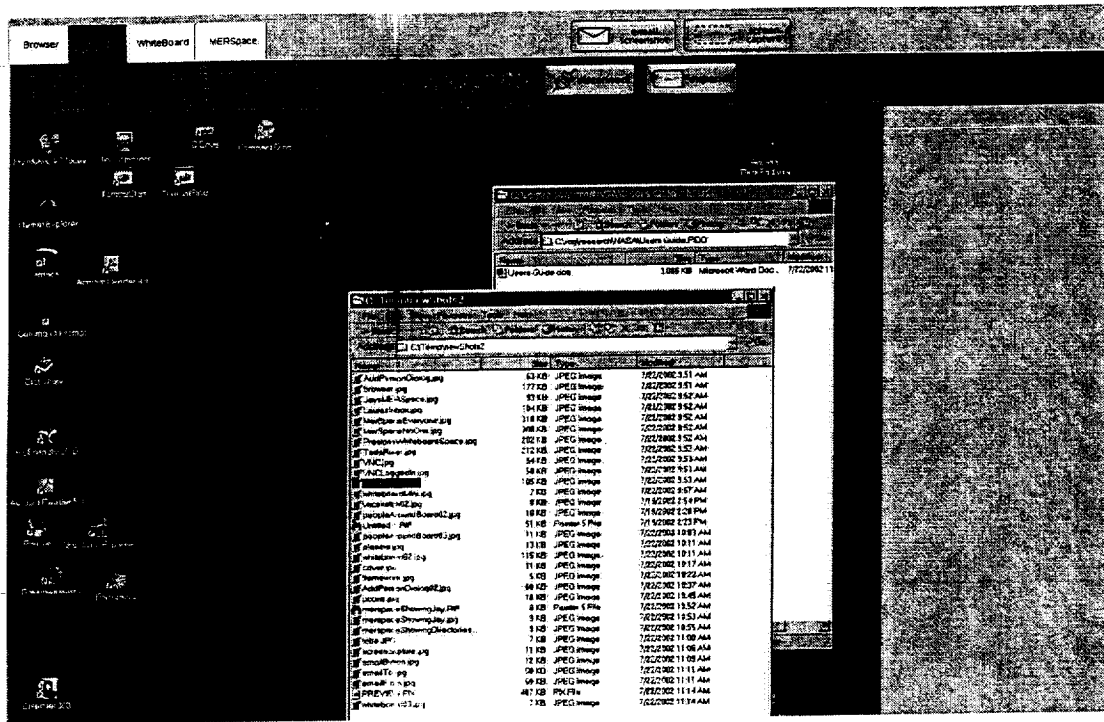
6 REMOTE INTERACTION (VNC)

6.1 PURPOSE

While the MERBoard supports important tools for collaboration and presentation, it can never expect to support all applications all the time. To allow users to display other information and present other applications, MERBoard supports the ability to remotely display from your personal computer onto the MERBoard:

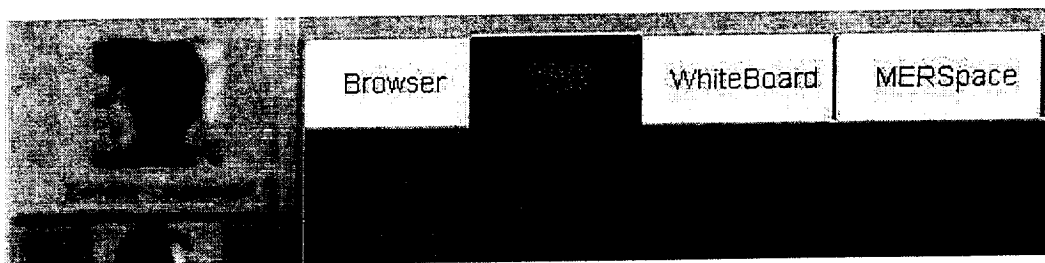


MERBoard achieves this by supporting the Virtual Network Computing (VNC) application. When you are "VNC'd" into the MERBoard, you can control your computer from your computer and see the results on the MERBoard screen, thus supporting a larger audience. You can also control your computer from the MERBoard itself.

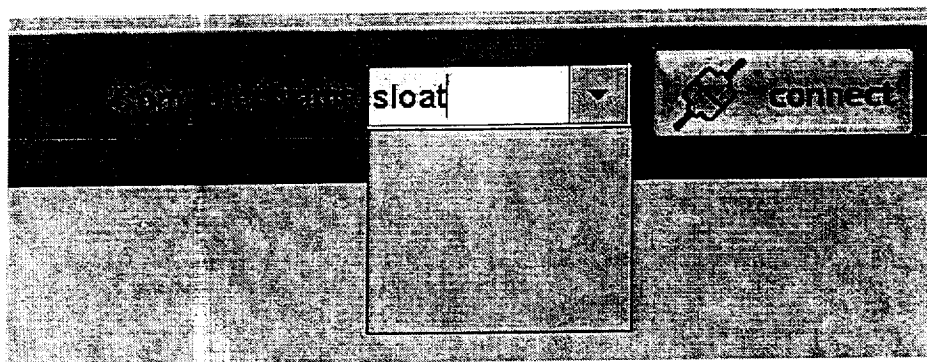


6.2 HOW TO REMOTELY CONNECT TO THE MERBOARD (AND LATER DISCONNECT)

1. Make sure your computer is on the same network as the MERBoard.
2. Click on the VNC tab at the top of the MERBoard



3. Type into the pull-down box the name or IP address of your machine



4. Click on the "Connect" button
5. You must then enter a password to allow the connection to occur

This will initiate a VNC connection with your machine. You can control your machine from the MERBoard or from your machine. In either case you will see what is on your machine displayed in the client area on the MERBoard.

To disconnect, simply click on the disconnect button:





7 RESTARTING THE BOARD

Should the MERBoard ever get stuck or not be running, the safest thing to do is reboot the machine. It will automatically start the MERBoard. To reboot the machine:

1. Press Ctrl-Alt-Delete
2. Select the "Shutdown..." button
3. From the pull-down menu, select "Restart"